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Mark A. Fredette

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EXAMINER

SCHINDLER, DAVID M

ART UNIT

PAPER NUMBER

2862

MAIL DATE

DELIVERY MODE

07/25/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/708,926

Applicant(s)

FREDETTE ET AL.

Examiner

David M. Schindler

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 April 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 10-22,35-37 and 39-41 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 10-22,35-37 and 39-41 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 April 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 11/27/2006.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application
- ☐ Other: _____.

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DETAILED ACTION

1. This action is in response to the communication filed 4/16/2007.

Response to Arguments

2. Applicant's arguments with respect to the pending claims have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

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5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary.

Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 10-15, 17-22, 35, 36, 39, 40, and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mumby (5,563,512) in view of Applicant's Admitted Prior Art (AAPA).

As to Claims 10 and 35,

Mumby discloses a propagation or induction resistivity antenna disposed on an elongated tubular having a longitudinal axis and adapted for subsurface disposal ((Title) and (Figure 1) and (Column 5, Lines 54-58), a lateral resistivity sensor (100) disposed in a recess (60) in the elongated tubular ((Figures 2B and 7) and (Column 8, lines 47-62)), a shield (24) disposed on and above the tubular to cover the recess and the lateral

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resistivity sensor ((Column 6, Lines 2-5) and (Column 9, Lines 16-19) and (Figures 2B and 7)).

Mumby does not disclose an insulating mechanism including a circumferential gap, the circumferential gap extending continuously about the tubular to prevent electric current flow in the shield in a direction parallel to the longitudinal axis of the tubular near the lateral resistivity sensor.

AAPA discloses an insulating mechanism (36) including a circumferential gap, the circumferential gap extending continuously about the tubular to prevent electric current flow in the shield in a direction parallel to the longitudinal axis of the tubular near the lateral resistivity sensor (35) ((Figure 3B) and (Page 10, Paragraph [0017])) (note that only one end of the shield is in contact with the tubular).

It would have been obvious to a person of ordinary skill in the art to modify Mumby to include an insulating mechanism including a circumferential gap, the circumferential gap extending continuously about the tubular to prevent electric current flow in the shield in a direction parallel to the longitudinal axis of the tubular near the lateral resistivity sensor as taught by AAPA in order to prevent the shield from short circuited the current so as to permit a transverse

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magnetic field to be induced in the formation (Page 10, Paragraph [0017], lines 5-8).

As to Claim 11,

Mumby does not disclose the lateral resistivity sensor includes a toroid.

AAPA discloses the lateral resistivity sensor includes a toroid ((Figure 3B) and (Page 10, Paragraph [0017])).

It would have been obvious to a person of ordinary skill in the art to modify Mumby to include the lateral resistivity sensor includes a toroid as taught by AAPA in order to advantageously utilize a readily available antenna configuration for lateral sensing.

As to Claim 12,

Mumby does not disclose an electrode disposed on the tubular, the electrode selected from one of a ring electrode, a button electrode, and a combination thereof.

AAPA discloses an electrode disposed on the tubular, the electrode selected from one of a ring electrode, a button electrode, and a combination thereof ((Figure 1B) and (Page 5, Lines 4-16)).

It would have been obvious to a person of ordinary skill in the art to modify Mumby to include an electrode disposed on the tubular, the electrode selected from one of a ring electrode, a

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button electrode, and a combination thereof as taught by AAPA in order to measure an azimuthally averaged current and azimuthal measurements and high-resolution imaging (Page 6, Lines 11-16).

As to Claim 13,

Mumby discloses the lateral resistivity sensor includes an insulating base layer (98) disposed in the recess in the tubular.

Mumby does not disclose a toroidal antenna disposed over the insulating base layer.

AAPA disclose a toroidal antenna (35) disposed over the insulating base layer (36) ((Figure 3B) and (Page 10, Paragraph [0017])).

It would have been obvious at the time of the invention to modify Mumby to include a toroidal antenna disposed over the insulating base layer as taught by AAPA in order to advantageously utilize a readily available antenna configuration for inducing a magnetic field in the formation (Page 9, Paragraph [0016], Lines 1-2).

As to Claim 14,

Mumby does not disclose the toroidal antenna includes a conductive wire disposed over the insulating layer.

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AAPA discloses the toroidal antenna includes a conductive wire disposed over the insulating layer ((Figure 3B) and (Page 10, Paragraph [0017]))).

It would have been obvious to a person of ordinary skill in the art to modify Mumby to include the toroidal antenna includes a conductive wire disposed over the insulating layer as taught by AAPA in order to advantageously utilize a readily available antenna configuration for inducing a magnetic field in the formation (Page 9, Paragraph [0016], Lines 1-2).

As to Claim 15,

Mumby does not disclose the toroidal antenna include a toroidal core formed from one of a magnetically permeable material wrapped in the tubular recess or a ferrite material disposed in the recess.

AAPA discloses the toroidal antenna include a toroidal core formed from one of a magnetically permeable material wrapped in the tubular recess ((Figure 3B) and (Page 9, Paragraph [0016]) and (Page 10, Paragraph [0017])).

It would have been obvious to a person of ordinary skill in the art to modify Mumby to include the toroidal antenna include a toroidal core formed from one of a magnetically permeable material wrapped in the tubular recess as taught by AAPA in order to advantageously utilize a readily available antenna

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configuration for inducing a magnetic field in the formation (Page 9, Paragraph [0016], Lines 1-2).

As to Claim 17,

Mumby does not disclose the circumferential gap is a continuously extending gap incorporated in the shield.

AAPA discloses the circumferential gap is a continuously extending gap incorporated in the shield ((Figure 3B) and (Page 10, Paragraph [0017])).

It would have been obvious to a person of ordinary skill in the art to modify Mumby to include the circumferential gap is a continuously extending gap incorporated in the shield as taught by AAPA in order to prevent the shield from short circuited the current so as to permit a transverse magnetic field to be induced in the formation (Page 10, Paragraph [0017], lines 5-8).

As to Claims 18 and 39,

Mumby does not disclose the circumferential gap is filled with an insulating material.

AAPA discloses the circumferential gap is filled with an insulating material (36) ((Figure 3B) and (Page 10, Paragraph [0017])).

It would have been obvious to a person of ordinary skill in the art to modify Mumby to include the circumferential gap is filled with an insulating material as taught by AAPA in order to

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prevent the shield from short circuited the current so as to permit a transverse magnetic field to be induced in the formation (Page 10, Paragraph [0017], lines 5-8).

As to Claims 19 and 40,

Mumby does not disclose the circumferential gap is includes an electrically insulating material disposed between a junction formed between the shield and the tubular.

AAPA discloses the circumferential gap is includes an electrically insulating material (36) disposed between a junction formed between the shield and the tubular ((Figure 3B) and (Page 10, Paragraph [0017])).

It would have been obvious to a person of ordinary skill in the art to modify Mumby to include the circumferential gap is includes an electrically insulating material disposed between a junction formed between the shield and the tubular as taught by AAPA in order to prevent the shield from short circuited the current so as to permit a transverse magnetic field to be induced in the formation (Page 10, Paragraph [0017], lines 5-8).

As to Claim 20,

Mumby discloses a section of the shield positioned over the induction or propagation resistivity antenna includes at least one slot filled with an insulating material (Abstract, Lines 7-10 / note sealant).

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As to Claim 21,

Mumby discloses the recess contains both the induction or propagation resistivity antenna and the lateral resistivity sensor (Column 7, Lines 50-60).

As to Claim 22,

Mumby discloses the tubular is a drill collar (Figure 1).

As to Claim 36,

Mumby discloses disposing the lateral resistivity sensor includes disposing a base layer of an insulating material (98) in the recess in the tubular ((Figures 2B and 7) and (Column 8, Lines 47-62)).

Mumby does not disclose assembling a toroidal antenna including a toroidal core and a conductive wire wound around the toroidal core, wherein the toroidal core includes a magnetically permeable material wrapped around the insulating base layer.

AAPA discloses assembling a toroidal antenna including a toroidal core and a conductive wire wound around the toroidal core, wherein the toroidal core includes a magnetically permeable material wrapped around the insulating base layer (36) ((Figure 3B) and (Page 9, Paragraph [0016]) and (Page 10, Paragraph [0017])).

It would have been obvious to a person of ordinary skill in the art to modify Mumby to include assembling a toroidal antenna

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including a toroidal core and a conductive wire wound around the toroidal core, wherein the toroidal core includes a magnetically permeable material wrapped around the insulating base layer as taught by AAPA in order to advantageously utilize a readily available antenna configuration for inducing a magnetic field in the formation (Page 9, Paragraph [0016], Lines 1-2).

As to Claim 41,

Mumby does not disclose the circumferential gap is incorporated into the tubular and positioned between the shield and the tubular.

AAPA discloses the circumferential gap (space with (36) filled in the gap) is incorporated into the tubular and positioned between the shield and the tubular ((Figure 3B) and (Page 10, Paragraph [0017])).

It would have been obvious to a person of ordinary skill in the art to modify Mumby to include the circumferential gap is incorporated into the tubular and positioned between the shield and the tubular as taught by AAPA in order to prevent the shield from short circuited the current so as to permit a transverse magnetic field to be induced in the formation (Page 10, Paragraph [0017], lines 5-8).

7. Claims 16 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mumby (5,563,512) in view of Applicant's Admitted Prior Art (AAPA) as applied to claims 10 and 35 and in further view of Sinclair (6,100,696).

As to Claims 16 and 37,

Mumby in view of AAPA disclose as explained above.

Mumby in view of AAPA do not disclose the lateral resistivity sensor includes a pressure compensating mechanism.

Sinclair discloses the lateral resistivity sensor includes a pressure compensating mechanism ((Figure 1) and (Column 6, Lines 17-35)).

It would have been obvious to a person of ordinary skill in the art to modify Mumby in view of AAPA to include the lateral resistivity sensor includes a pressure compensating mechanism as taught by Sinclair in order to remove high pressure differentials from the sensor package (Column 6, Lines 30-32).

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David M. Schindler whose telephone number is (571) 272-2112. The examiner can normally be reached on Monday-Friday (8:00AM-5:00PM).

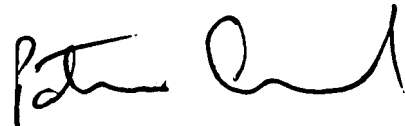
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Assouad can be reached on (571) 272-2210. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

David M. Schindler
Examiner
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DMS

A handwritten signature in black ink, appearing to read 'Patrick Assouad', is written over a horizontal line.

**PATRICK ASSOUD
SUPERVISORY PATENT EXAMINER**